GEOLOGICAL – EDUCATIONAL (GEOTOURISTIC) MAP OF THE CEROVA VRCHOVINA UPLAND, 1:50 000

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Abstract: The public is made familiar with the main features of the geology and development of the territory and with examples of selected localities and protected natural monuments. Thanks to the map consisting of geological information accompanied with data concerning nature conservation ant tourist routs, the wide public will get a completed idea about the given territory. On the back side of the map there is a brief text guide, which provides information about the individual localities and protected natural monuments by brief descriptions, photographs and drawings with recommended tourist routes.

Key words: Geological - educational map, new edition, Cerova vrchovina Upland, environment.

Introduction

Geological Survey of Slovak Republic (ŠGÚDŠ) in cooperation with organization the State Protection of the Nature represented by the agency Protected Landscape Area of the Cerová vrchovina Upland and under patronage of the Ministry of Environment of the Slovak Republic (MŽP SR) issued in the year 2001 a pilot map of the new edition of Geological - educational maps of Slovakia (Elečko et al., 2001).

The goal of geological - educational (tourist) maps is to bring knowledge of the geology of the territory (which is the base for development of the living nature) in a popular form closer to the general public. Knowledge of the history of non-living nature development is a part of a cultural history and spiritual wealth of the nation. In a friendly and simple form the public is made familiar with the main features of the geology and geological development of the territory and with examples of selected localities and protected natural monuments. Thanks to the map consisting of geological information accompanied with data concerning nature conservation and tourist routs, the wide public will get a completed idea about the

given territory. In the attachment of the map there is a brief text guide providing information about the individual localities and protected natural monuments by brief descriptions, photographs and/or drawings with recommended tourist routes.

Basic feature of Cerová vrchovina Upland geology

Since 1989, the major part of Cerová vrchovina Upland has got a status of a protected landscape area (The PLA Cerová vrchovina.). Especially the young volcanic landscape (relief) gives Cerová vrchovina Upland its special character.

The Upland is built up by sandstone's, the hill peaks and elongated ridges are formed by volcanic rocks especially basalt's, in surroundings of Šiatorská Bukovinka also by andesites ((Elečko et al., 1985; Vass et al., 1992; Vass, Elečko (eds.) 1992).

The occurrence of marine sediments indicates that to the end of Paleogene and the beginning of Neogene (Kiscel, Eger), the Southern Slovakia was covered by the sea. The oldest marine sediments - the limy siltstones, were formed in the Buda marine basin, which encroached upon actual northern margin of the Lučenec and Rimavská kotlina Depressions from Northern Hungary. Later on, during early stages of Miocene (Eggenburgian), the sea regressed to give way to a new transgression, which enabled formation of a Fiľalovo/Pétervására Basin. However, only littoral sediments of the Fiľakovo Formation have been spared from the erosion.

Having had a shape of a bay opened towards the north and Northeast, the basin was accessed by tidal waves, which progressed along the western side of the basin, causing the sedimentation of the Lipovany Sandstone with abundant thick-walled lamellibranch shells and scarce occurrence of the ripple cross-lamination. The ebb currents, strongly amplified due to growing tidal intensity and proceeding along the eastern margin off the bay, had been able to form coarse sand dunes high as much as several meters. By this way the Jalová Sandstone, with impressive series of coarse cross bedding and with broad bed washouts at their bases, was formed. Meanwhile, in the deeper parts of the bay and away from the immediate influence of the tidal currents the Tachty Sandstone have been formed. It differs from the Jalová Sandstone by finer sandstone and absence of the high-energy cross bedding. In the Jalová Sandstone as well as in the Tachty Sandstone only scarce shells of marine molluscs can be found. This can be caused by the strong current activity in the former case and probably by the salinity fluctuation eliminating the life of molluscs in the later case. At a greater distance from the shore, in deeper waters, the Čakanovce Member was formed. It is

composed of silt and silts clay with abundant thin-walled shells of marine molluscs, indicating more deep-sea and calm environment with the normal marine salinity.

Still during the Eggenburgian stage, the Cerová vrchovina Upland and its broader surroundings (i.e. the whole present Pannonian Basin) began to rise. The Fiľakovo/Pétervásara Basin disappeared and its sediments appeared at the dry land exposed to the erosion. The river courses dissected the area and deposited their alluvial sediments in numerous places of the Cerová vrchovina Upland. They include gravel's, sands and variegated clays of the Bukovinka Formation (Late Eggenburgian). Later on, during Ottnangian, when the area was extensively peneplanated, the rivers deposited only sand sediments. The swamp and bogs evolved in their alluvial plains and temporary coals sedimentation took place. Consequently two or locally three coal seams, found amidst sands of the Pôtor Member, were formed. Fluvial sedimentation had been replaced by the sedimentation in a calm lake, where the monotonous Plachtince Clay deposited. The Pôtor Member and Plachtince Clay are gathered in the Šalgótarján Formation of the Ottnangian age. Proximity of the transgressing sea was demonstrated by local marine incursions into the swamps and later into the lake what is proved by intercalation's, containing marine fauna, which suddenly appear in otherwise fossil-free sand and clay of the Šalgotarján Formation. The sea most likely entered the area of Cerová vrchovina Upland to the end of the Early Miocene, during the Karpatian stage, but later a long lasting uplift of the area caused erosion denudation and the marine sediments were removed.

During the Middle Miocene Badenian stage, i.e. some 16 Ma ago, the andesite magma intruded the sandstone's of the Fiľakovo Formation, giving the way to formation of the laccolith bodies and veins of andesite with garnet. As the magma cooled down below the surface, its thermal effect altered the surrounding sandstone. Having been relatively more resistant to the erosion, the andesite intrusive bodies are now exposed in the highest peaks of the Cerová vrchovina Upland - the Šiator and the Karanč.

During the process of its formation, the drainage system respected these andesitic outliners and the rivers, carving the valleys, avoided them. Basaltic volcanic activity, which started in the Cerová vrchovina Upland during the Pliocene stage, produced a variety of volcanic forms (Cerová Basalt Formation). On the surface the explosive forms as the scoria cones and maars were formed. At the foot of scoria cones large lava covers (plateau's) originated formed by numerous lava flows. Some of the lava flows moved farther from the scoria cones, proceeding the paleovalleys of the drainage system. The processes forming maars and some of the scoria cones had a character of freatic explosions (water vapour

explosions) during the initial period, later they were replaced by the freato-magmatic eruptions (lapilli tuffs eruption.). During the final period of this development, volcanic bomb eruptions (Strombolian type) frequently prevailed; alternatively also Hawaiian eruption type in the form of lava fountains occurred. After the end of volcanic activity, the subsurface feeding channels were preserved in the form of erosions remnants like lava necks, dikes and diatremes. Petrography type of the basalt volcanism products comprises basanites (basalt without foods, but often with phenocrysts of yellow-green olivine). In the course of this volcanic activity the vault uplift of the Cerová vrchovina Upland took place. The selective erosion gave a way to the relief inversion; the basalt lava flows, which originally filled the paleovalleys, now form tops of elongated ridges of the Cerová vrchovina Upland. The basalt volcanism of the Cerová vrchovina Upland lasted from the beginning of Pliocene (approx. 5 Ma) till the Early Pleistocene (approx. 1.2 Ma).

Basic information on living nature of Cerová vrchovina Upland.

Beside the impressive volcanic relief, the Upland is remarkable also by the occurrence of rare and endangered flora and fauna. The forest covers approximately 2/3 of the protected area. The oak tier of vegetation extends in the lowermost position. The assemblage of the hornbeam - oak woods (Carpineto – Quarcetum) occupies the lowlands, trees like oak, turkey oak, hornbeam, black locust and scrubs like hazel, hawthorn and cornelian are growing there. The assemblage of the xero-thermophilic oak woods (Corneto-Quercetum) occurs only in small enclaves. It is growing on the dry, stony slopes of the forest-steppe character, with following woods: pubescent oak, sessile oak, field maple; and scrubs: cornelian, common privet, black locust. In the forest of the oak tier the Lychnis coronaria, scilla bifolia, as well as rare colurea arborescens grow.

The forest of beech-oak tier covers the largest areas of the Upland territory, particularly on the slopes of different inclination and exposition. The assemblage of beech-oak (Fageto-Quercetum) consists of the sessile oak, European beech, turkey oak, hornbeam, Norway maple and scrubs: common privet, hawthorn and hazel. Among the herbs there are protected taxa of ***vstavačovité a kruštíky***.

The oak-beech assemblage is growing on the slopes and tops of upland and at the colder northward oriented foothills.

The assemblage of oak-beech (Querceto-Fagetum) is growing on more humid sites. The European beech prevails about the sessile oak, linden, bird cherry, Norway maple and

hornbeam. The beech woods (Fagetum pauper) grow in the cold gorges Among beeches there are some oaks.

The beech tier is of isolated occurrence. It is an assemblage of the typical beech woods on the cold and humid slopes and foothills. The beech prevails, the oak and maple occurrence is rare.

In the forest of Cerová vrchovina Upland there are beside Capreolus capresolus, Sus scrofa, Cervus elaphus and the artificial introduced Ovis musimou also some Carnivora, for example: Vulpes vulpes, Felis silvestris, Meles meles, Martes martes. The forest is rich in birds.

The areas, deforested in the past, have been changed to grassland, meadows and fields. On the southern sunny and dry slopes, the assemblage of grass steppe and around the rocky cliffs the assemblage of forest steppe evolved. There are xerothermic assemblage with Pulsatilla prateusis, Pulsatilla grandis, Iris pumila, Chrysopogon gryllus and Stipa joannis. They represent ***genofund areas.*** This is also a convenient biotope of the thermophilic insects and some of the internationally protected bird species are living there.

In the shallow valleys characteristic farms – "pustas" with typical beam wells and specific country architecture have been situated. The environment together with many elements of human activity gives the country a specific complexity full of unusual charm and uniqueness.

In the explanatory notes and also in the map itself there are notes and/or indications about archaeological sites of various prehistoric cultures (near villages Drňa, Hodejov, at the castle Pohanský hrad near the village Stará Bašta, and villages near Radzovce and Šurice); about interesting historic monuments - ruins of castles (Fiľakovo, Šomoška, Hajnačka, Šurice, Hodejov, also hardly recognizable remnants of the castles Michalov hrad, Pohanský hrad situated south-westward of the village Chrámec, monastery on the Biriň hill and the castle Širkovský hrad southward of the equally named village); about historic, cultural-architectonic and sacral monuments in the towns Lučenec, Fiľakovo and in several villages in the Cerová vrchovina upland.

Application of the map is focused on:

- development of tourist industry,
- publicity-educational and enlightenment goals,
- teaching aids for schools in outdoor interactive teaching of natural sciences, for preparation and realization of field excursions and trips,

- popularization of the region for agrotourism and travel industry in general, including civil activities.

By issuing of the pilot map the geologists and environmentalists make accessible and explain matters of interest of the country with an intention to call attention of the wide public (tourists, teachers and school - youth as well as nature lovers in general) to the beauty of the Cerová vrchovina Upland, and also with the goal to protect it for future generations.

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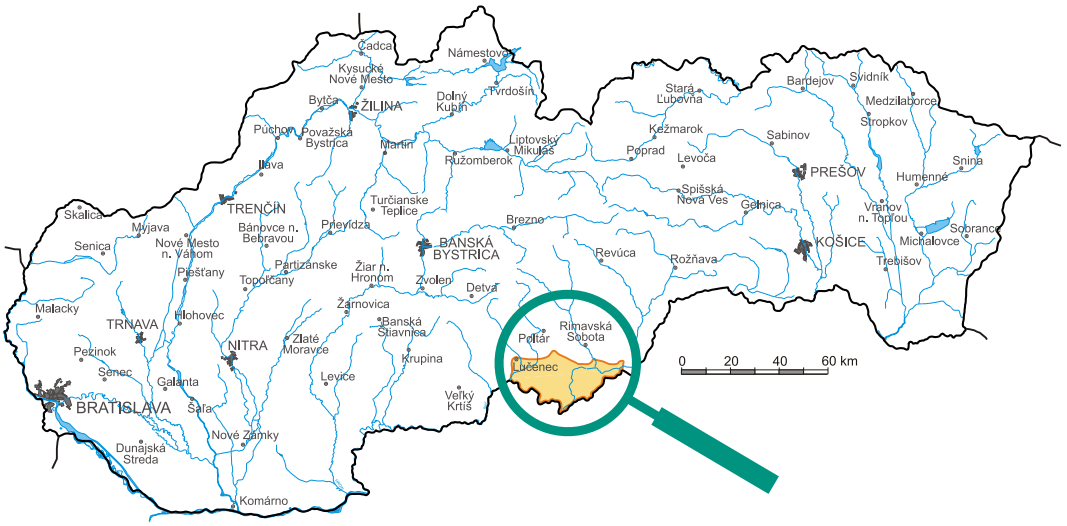
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Námestovo
Kysucké Nové Mesto
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ŽILINA
Dolný Kubín
Púchov
Považská Bystrica
Martin
Liptovský Mikuláš
Ružomberok
Ilava
TRENČÍN
Turčianske Teplice
Skalica
Myjava
Bánovce n. Bebravou
Prievidza
Senica
Nové Mesto n. Váhom
BANSKÁ BYSTRICA
Partizánske
Žiar n. Hronom
Piešťany
Topoľčany
Zvolen
Detva
Žarnovica
Malacky
TRNAVA
Hlohovec
Banská Štiavnica
NITRA
Zlaté Moravce
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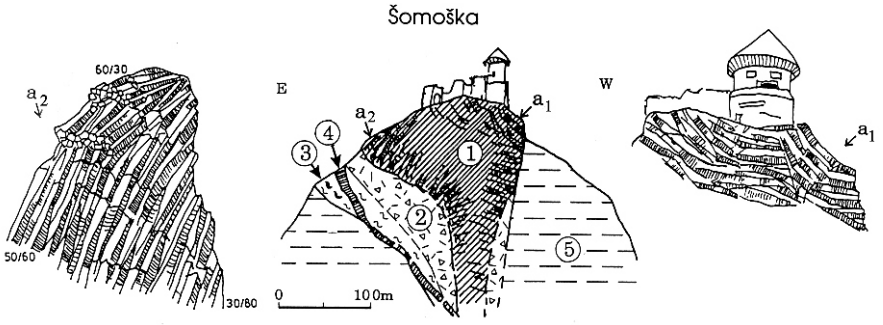
Spišská Nová Ves
Gelnica
Bardejov
Svidník
Medzilaborce
Stropkov
Sabinov
PREŠOV
Humenné
Snina
Vranov n. Topľou
KOŠICE
Michalovce
Sobrance
Trebišov
0 20 40 60 km

Lokalita č. 41 Šomoška (E 4). *Odlučnosť bazaltových stĺpcov tvorí "kamenný vodopád".*
Locality 41 Šomoška (E 4). *Columnal jointing of basalts forms "stony waterfall".*



Lokalita č. 41 Šomoška (E 4). *Schéma stavby bazaltového neku a diatrémy: 1 - bazaltový nek, a1 - stĺpcová odlučnosť pri západnom okraji neku, a2 - stĺpcová odlučnosť pri východnom okraji neku; 2 - tufy a brekcie vo výplni diatrémy; 3 - bazaltové trosky pri okraji diatrémy; 4 - bazaltová dajka; 5 - spodnomiocénne sedimenty.*
Locality 41 Šomoška (E 4). *Structure scheme of the basalt neck and diatreme. 1 - basalt neck, a1) - columnar jointing at the neck's western margin, a2) - columnar jointing at the neck's eastern margin, 2 - tuffs and breccias in diatreme's fill, 3 - basalt scoria at diatreme's edge, 4 - basalt dike, 5 - the Early Miocene sediments.*